IS 612 (1992): Roasted Chicory Powder [FAD 6: Stimulant Foods]

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IS 612 : 1992
(Reaffirmed ~~1998~~ xxxxx
2009

भारतीय मानक

भुना हुआ कासनी चूर्ण — विशिष्टि

(तीसरा पुनरीक्षण)

Indian Standard

ROASTED CHICORY POWDER — SPECIFICATION

(Third Revision)

UDC 663·941·34

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

June 1992

Price Group 4

FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards, after the draft finalized by the Stimulant Foods Sectional Committee had been approved by the Food and Agriculture Division Council.

Roasted chicory powder is made by roasting and powdering suitably cleaned and dried roots of *Chichorium intybus* Linn. Substances, such as edible fats and oils, and sugars, like sucrose and glucose, in proportions not exceeding two percent by mass in aggregate are often added to the product, before roasting.

This standard was issued earlier in 1962 and revised in 1971 and 1983. In view of the technological advances, the standard is being revised again. The revised version incorporates changes in the cup test as well as labelling requirements. The limit of acid insoluble ash has been reduced from 1·5 to 1·0 percent.

While formulating this standard, due consideration has been given to the relevant Rules issued by the Government of India under the *Prevention of Food Adulteration Act, 1954* and the *Standards of Weights and Measures (Packaged Commodities) Rules, 1977.* This standard is, however, subject to the restrictions imposed under these Rules, wherever applicable.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

AMENDMENT NO. 1 DECEMBER 2009
TO
IS 612 : 1992 ROASTED CHICORY POWDER — SPECIFICATION

(Third Revision)

[*Page* 2, *clause* **4.2**, *Sl No.* (d)] — Substitute 'Net quantity' *for* 'Net mass'.

(FAD 6)

Reprography Unit, BIS, New Delhi, India

Indian Standard

ROASTED CHICORY POWDER — SPECIFICATION

(Third Revision)

1 SCOPE

1.1 This standard prescribes the requirements and the methods of sampling test for roasted chicory powder.

2 REFERENCES

The following standards are necessary adjuncts to this standard:

IS No.	*Title*
265 : 1987	Specification for hydrochloric acid (*third revision*)
1070 : 1992	Reagent grade water (*third revision*)
2491 : 1972	Code for hygienic conditions for food processing units (*first revision*)
4905 : 1968	Method for random sampling.

3 REQUIREMENTS

3.1 Description

The material shall be made by roasting and grinding suitably cleaned, dried and graded chips of chicory roots (*see* Note). Substances, such as edible fats and oils, sucrose and glucose, in proportions not exceeding 2 percent by mass in aggregate may be added to the material before roasting. It may be such a degree of fineness as desired by the purchaser. It shall be substantially free from dirt, extraneous matter, added colouring and flavouring agents and shall be totally free from insect infestation. Substances not derived from chicory shall not exceed one percent.

NOTE — In Fig. 1 to 3 are shown sections of chicory root under the microscope to enable identification in case of doubt.

3.2 Cup Test

The material shall be evaluated for cup test in accordance with the procedure prescribed in Annex A.

3.3 Microscopic Appearance

When the material is subjected to microscopic examination as prescribed in Annex B, the characteristic appearance shall be similar to the photomicrograph as shown in Fig. 4.

3.3.1 *Chief Microscopic Characteristics of Roasted Chicory Powder*

Under the microscope, roasted chicory powder reveals rectangular cork cells, transversely elongated reticulated ducts with perforations and tubular ducts resembling jointed cylinders often with overlapping joints.

3.4 The material shall be manufactued in premises maintained under hygienic conditions (*see* IS 2491 : 1972). The handling equipment like roasters, grinders and packing equipment shall be clean and free from any objectionable odour.

3.5 The material shall also comply with the requirements given in Table 1.

Table 1 Requirements for Roasted Chicory Powder

Sl No.	Characteristic	Requirement	Method of Test, Ref to Annex
(1)	(2)	(3)	(4)
i)	Moisture, percent by mass, *Max*	10·0	C
ii)	Total ash (on dry basis), percent by mass	3·5 to 8·0	D
iii)	Acid insoluble ash (on dry basis), percent by mass, *Max*	1·0	E
iv)	Water soluble matter (on dry basis), percent by mass, *Min*	60	F

4 PACKING AND MARKING

4.1 Packing

The material shall be packed in 25 g, 100 g, 200 g, 500 g, 1 kg and multiples thereof in air-tight tin-plate or glass containers or in suitable metal foil laminate containers with food grade plastic lining. Where metal foil laminate containers with plastic lining are used, a cautionary note to the following affect shall be printed:

'Once opened transfer contents immediately into air-tight container'.

Bulk packing may be done in gunny bags with a polyethylene liner, the contents of which shall be 25 kg and 50 kg.

NOTE — Other food grade packaging materials can be used subject to their suitability being established.

4.2 Marking

The following particulars shall be marked legibly and indelibly on the label of the container:

a) Name of the material;
b) Name and address of the manufacturer;
c) Batch or code number;
d) Net mass of contents;
e) Month and year of manufacture;
f) List of ingredients;
g) The statement 'use no hooks' along with pictorial markings;
h) The following cautionary note shall be printed on flexible containers;

'Once opened, transfer contents immediately into air-tight container'; and

j) Any other requirements laid down under the *Standards Weights and Measures (Packaged Commodities) Rules, 1977/ Prevention of Food Adulteration Rules, 1955.*

4.2.1 *Standard Mark*

The container may also be marked with the Standard Mark.

5 SAMPLING

5.1 Representative samples of the material shall be drawn and criteria for ascertaining conformity of the material to the requirements of this specification shall be as prescribed in Annex G.

6 TESTS

6.1 Tests shall be carried out as prescribed in **3.2**, **3.3** and Annexes specified in col 4 of Table 1.

6.2 Quality of Reagents

Unless specified otherwise, pure chemicals shall be employed in tests and distilled water (*see* IS 1070 : 1992) shall be used where the use of water as a reagent is intended.

NOTE — 'Pure chemicals' shall mean chemicals that do not contain impurities which affect the test results.

ANNEX A
(*Clause* 3.2)

CUP TEST

A-1 PROCEDURE

A-1.1 Appearance

Note the colour and appearance.

A-1.2 Cup Test

Weigh 3 g of material into a glazed, clean, non-smelling porcelain cup of 250-ml capacity. Pour 200 ml of boiling fresh water into the cup and stir. Close the cup with the lid and steep for 5 minutes. Smell the brew in the cup and record the characteristic aroma of roasted chicory. Suck in the brew from a table spoon and whirl the brew in the mouth with the tongue and register the taste and smell.

A-1.3 Precautions

A-1.3.1 The cup test should preferably be conducted an hour after breakfast and an hour before lunch. The panelists should not smoke during the thirty minutes before the testing session and should also refrain from using perfume before testing.

A-1.3.2 The panelists should record their reactions in the proforma immediately after evaluating an attribute.

A-1.3.3 In one session, not more than 8 samples should be tested.

A-1.4 Note the particulars of the chicory powder in the following manner:

Colour	*Brew*
Light brown and uniform	Good clear infusion and good taste
Medium brown and uniform	Medium clear infusion and average taste
Dark brown	Light clear infusion
Black roast	Poor and unacceptable infusion

A-1.5 Scoring

Only the brew is to be allotted marks for the purpose of the score card. The maximum number of marks to be given is 25. They may be 20 to 25 for the brew of good clear infusion and good taste, 15 to 19 for medium clear infusion and good taste, 10 to 14 for light clear infusion and average taste and below 10 for the poor and unacceptable infusion. From the marks allotted, deductions may be made at 2 marks for each of the following defects:

a) Earthy taste,

FIG. 1 LONGITUDINAL SECTION OF CHICORY ROOT SHOWING ELONGATED PARANCHYMAL CELLS WITH RETICULATED DUCTS (PERIODIC ACID AND SCHIFFS ×100)

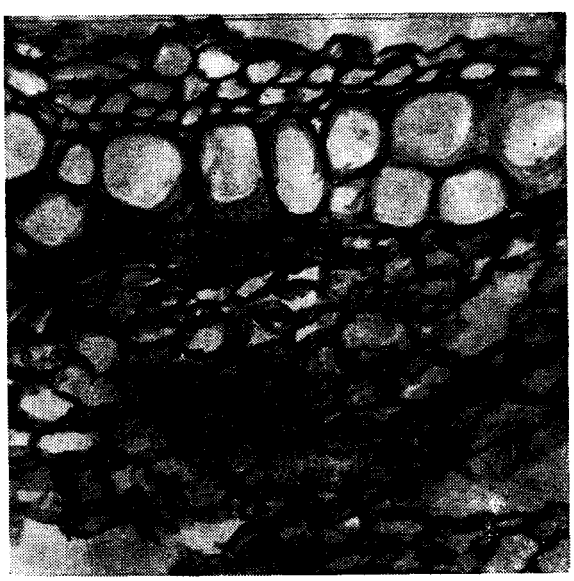

FIG. 2 TRANSVERSE SECTION OF CHICORY ROOT SHOWING RETICULAR AND TRANSVERSE PARANCHYMAL CELLS WITH DIFFERENT SIZES (PERIODIC ACID AND SCHIFFS ×100)

FIG. 3 LONGITUDINAL SECTION OF CHICORY ROOT SHOWING ELONGATED TUBULAR DUCTS (FEULGEN REACTION SCHIFFS ×100)

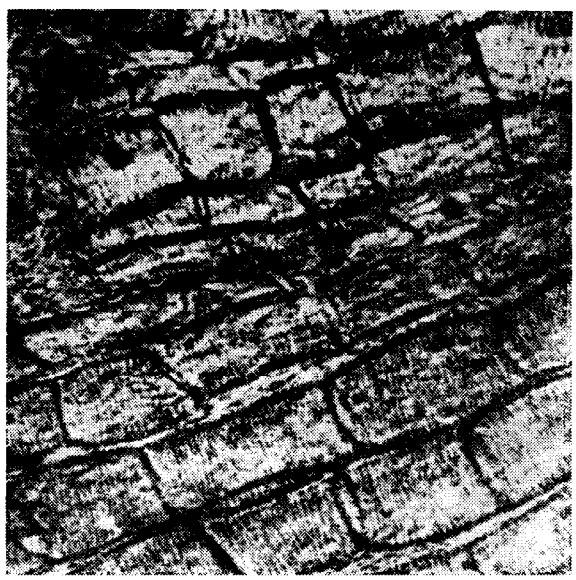

FIG. 4 PHOTOMICROGRAPH OF ROASTED CHICORY POWDER ×100

b) Stale taste,

c) Smoky taste or smell, and

d) Musty and foreign taste or smell.

A-1.6 Grading

The material shall be declared as good, fair, average or poor on the following basis:

Score	*Grading*
20 to 25	Excellent
15 ,, 19	Good
10 ,, 14	Fair
Below 10	Poor

A-1.7 The roasted chicory powder shall be deemed to have passed the cup test if the score is above 15.

ANNEX B

(*Clause* 3.3)

MICROSCOPIC APPEARANCE OF ROASTED CHICORY POWDER

B-1 APPARATUS

B-1.1 Microscope

With an eye-piece micrometer calibrated with a side micrometer and having a magnification of 300 to 500.

B-1.2 Microscope Slides

B-1.3 Cover Glasses

Either circular or square.

B-2 REAGENTS

B-2.1 Sodium Hydroxide Solution

2 percent (*m/v*)

B-2.2 Collodion

Solution of nitrated cellulose in ether and alcohol.

B-2.3 Schiff's Reagent

Prepared by dissolving 1 g of fuchsin in 110 ml of 1 N hydrochloric acid, adding 5 g of sodium bisulphite ($NaHSO_3$) and making up to one litre.

B-3 PROCEDURE

B-3.1 Microscopic Examination

Take about one gram of the material and transfer it to a beaker containing 50 ml of 2 percent sodium hydroxide solution. Stir the contents by means of a glass rod and boil for 3 to 4 minutes. Decant the supernatant liquid and add 50 ml of water to the remainder, boil again and decant. Repeat this process till the residual powder gives no colour with water. Smear the material on the slide, cover with one percent collodion. Treat with Schiff's reagent for 15 minutes. Wash in running water for 5 minutes. Dehydrate in ethyl alcohol. Clear in xylol and mount in Canada Balsam and examine under microscope. Vessels stain deeply pink and other substances remain unstained.

ANNEX C

[*Table* 1, *Item* (i), D-2.1, E-3.1 *and* F-2.1]

DETERMINATION OF MOISTURE

C-1 PROCEDURE

C-1.1 Weigh accurately about 5 g of the material in a tared dish (about 8·5 cm in diameter). Place the dish in an oven and dry at 100 ± 2°C for 6 hours. Cool the dish in a desiccator and weigh. Dry again at 100 ± 2°C for 30 minutes, cool in a desiccator and weigh. Repeat the process of heating for 30 minutes, cooling in a desiccator and weighing, until the difference between two successive weighings is less than one milligram. Record the lowest mass.

NOTE — Preserve the dish containing dried material for the determination of acid insoluble ash (*see* D-1.1).

C-2 CALCULATION

C-2.1 Moisture, percent by mass $= \frac{100\,(M_1 - M_2)}{M_1 - M}$

where

M_1 = mass, in g, of the dish with the material before drying;

M_2 = mass, in g, of the dish with the material after drying; and

M = mass, in g, of the empty dish.

ANNEX D

[*Table* 1, *Item* (ii)]

DETERMINATION OF TOTAL ASH

D-1 PROCEDURE

D-1.1 Take the dried material in the dish (*see* **C-1.1**). Ignite in a muffle furnace at 550 ± 10°C until grey ash results. Heat the dish again at 550 ± 10°C for 30 minutes. Cool the dish in a desiccator and weigh. Repeat this process of heating for 30 minutes, cooling in a desiccator and weighing, until the difference between the two successive weighings is less than one milligram. Record the lowest mass.

NOTE — Preserve the dish containing this ash for the determination of acid insoluble ash (*see* **E-2.1**).

D-2 CALCULATION

D-2.1 Total ash (on dry basis), percent by mass $= \frac{10\,000\,(M_2 - M)}{(M_1 - M)\,(100 - M_3)}$

where

M_2 = mass, in g, of dish with the ash;

M = mass, in g, of empty dish;

M_1 = mass, in g, of dish with the material; and

M_3 = percent of moisture as determined in Annex C.

ANNEX E

[*Table* 1, *Item* (iii)]

DETERMINATION OF ACID INSOLUBLE ASH

E-1 REAGENT

E-1.1 Dilute Hydrochloric Acid

Approximately 1 : 2·5 prepared from concentrated hydrochloric acid (*see* IS 265 : 1976).

E-2 PROCEDURE

E-2.1 To the ash contained in the dish (*see* **D-1.1**), add 25 ml of dilute hydrochloric acid, cover the dish with a watch-glass and heat it on a water-bath for 10 minutes. Allow to cool and filter the contents of the dish through Whatman filter paper No. 42 or its equivalent. Wash the filter paper till the washings are free from the acid. Return the filter paper and the residue to the dish. Keep it in an oven maintained at 100 ± 2°C for about 3 hours. Ignite in a muffle furnace at 550 ± 10°C for one hour. Cool the dish in a desiccator and weigh. Repeat the process of igniting in a muffle furnace, cooling and weighing at half-hour intervals until the difference in mass between two successive weighings is less than one milligram. Record the lowest mass.

E-3 CALCULATION

E-3.1 Acid insoluble ash (on dry basis)

$$= \frac{10\,000\,(M_2 - M)}{(M_1 - M)\,(100 - M_3)}$$

where

M_2 = mass, in g, of dish with acid insoluble ash;

M = mass, in g, empty dish (*see* **D-2.1**);

M_1 = mass, in g, of dish with the material (*see* **D-2.1**); and

M_3 = the percentage of moisture as determined in Annex C.

ANNEX F

[*Table* 1, *Item* (iv)]

DETERMINATION OF WATER SOLUBLE MATTER

F-1 PROCEDURE

F-1.1 Weigh accurately about 2 g of the material in an 500-ml Erlenmeyer flask and add 200 ml of water and reflux over a low flame for one hour. Cool and filter into a 250-ml volumetric flask through Whatman filter paper No. 1 or its equivalent, wash three times with 10 to 15 ml of water and finally make up to the mark. Shake well and pipette a 50-ml aliquot in a tared dish and evaporate on a water-bath. After complete evaporation, dry for one hour in an oven at 100 ± 2°C, cool in a desiccator and weigh. Dry again at 100 ± 2°C for 30 minutes,

cool in a desiccator and weigh. Repeat this process of heating for 30 minutes, cooling in a desiccator and weighing until the loss in mass between two successive weighings is less than one milligram. Record the lowest mass.

F-2 CALCULATION

F-2.1 Water soluble matter (on dry basis),

$$= \frac{50\,000\,(M_2 - M_1)}{M\,(100 - M_3)}$$

where

M_2 = mass, in g, of dish with the dried water soluble matter;

M_1 = mass, in g, of empty dish;

M = calculated mass, in g, of sample taken for the test; and

M_3 = the percentage of moisture as determined in Annex C.

ANNEX G

(*Clause* 5.1)

SAMPLING OF ROASTED CHICORY POWDER

G-1 GENERAL REQUIREMENTS OF SAMPLING

G-1.0 In drawing, preparing, storing and handling samples, the precautions and directions given in **G-1.1** to **G-1.6** shall be observed.

G-1.1 Samples shall be taken in a protected place not exposed to damp air, dust or soot.

G-1.2 The sampling instrument, preferably a spoon or spatula, shall be clean and dry when used.

G-1.3 The samples, the material being sampled, the sampling instrument and the containers for samples, shall be protected from adventitious contamination.

G-1.4 The samples shall be placed in clean and dry glass or tin containers. The sample containers shall be of such a size that they are almost completely filled by the sample.

G-1.5 Each container shall be sealed air-tight after filling and marked with full details of sampling, batch or code number, name of the manufacturer and other important particulars of the consignment and lot.

G-1.6 Samples shall be stored in such a manner that the temperature of the material does not vary unduly from the normal temperature and that they are protected from light.

G-2 SCALE OF SAMPLING

G-2.1 Lot

In any consignment the containers of the same size batch of manufacture shall be grouped together to constitute a lot.

G-2.2 Samples shall be tested for each lot separately for ascertaining conformity of the material to the requirements of this specification.

G-2.3 The number of containers to be tested from a lot shall depend on the size of the lot and shall be in accordance with Table 2.

Table 2 Scale of Sampling

Number of Containers in the Lot (N)	Total Number of Containers to be Selected (n)
(1)	(2)
Up to 50	2
51 ,, 100	3
101 ,, 150	4
151 ,, 300	5
301 ,, 500	6
501 ,, 1 000	7
1 001 ,, 3 000	8
3 001 ,, 10 000	9
10 001 and above	10

G-2.2.1 These containers shall be chosen at random from the lot. In order to ensure randomness of selection, procedures given in IS 4905 : 1968 may be allowed.

G-3 TEST SAMPLES AND REFEREE SAMPLES

G-3.1 Preparation of Individual Samples

The contents of each of the containers selected according to **G-2.3** shall be poured out and mixed thoroughly. About 60 g of material shall be taken from this and divided into three equal parts. Each part so obtained, shall be transferred to a sample container which shall be sealed air-tight and labelled with the particulars given in **G-1.5**. One of these sets shall be marked for the purchaser, another for the vendor and the third for the referee.

G-3.2 Preparation of Composite Sample

From the mixed material of each selected container remaining after taking the sample according to **G-3.1**, approximately equal quantities of material shall be taken and mixed together so as to form a composite sample weighing not less than 30 g. This composite sample shall be divided into three equal parts and transferred to sample containers and labelled with all the particulars given in **G-1.5**. One of these composite samples shall be for the purchaser, another for the vendor and the third for the referee.

G-3.3 Referee Sample

Referee sample shall consist of a set of samples obtained in **G-3.1** and a composite sample obtained according to **G-3.2**, marked for this purpose and shall bear the seals of the purchaser and the vendor. These shall be kept at a place and under conditions agreed to between the purchaser and the vendor so as to be used in case of a dispute between the two.

G-4 NUMBER OF TESTS

G-4.1 The tests for the moisture, water soluble matter and cup-test shall be conducted on individual samples as obtained in **G-3.1.**

G-4.2 The tests for the determination of the remaining requirements of the standard shall be done on the composite sample as obtained in **G-3.2.**

G-5 CRITERIA FOR CONFORMITY

G-5.1 The lot shall be declared as conforming to the requirements of this specification of **G-5.1.1** and **G-5.1.2** are satisfied.

G-5.1.1 The results of the tests conducted on the individual samples for the requirements specified in **G-4.1** shall satisfy the corresponding specification requirements as given in **3.**

G-5.1.2 The results of the tests conducted on the composite sample for the remaining requirements shall satisfy the corresponding specification requirements as given in **3.**

Standard Mark

The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act, 1986* and the Rules and Regulations made thereunder. The Standard Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well defined system of inspection, testing and quality control which is devised and supervised by BIS and operated by the producer. Standard marked products are also continuously checked by BIS for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

Bureau of Indian Standards

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Doc : No FADC 23 (4152)

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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Printed at New India Printing Press, Khurja, India